



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,208	06/03/2005	Niclas Wiberg	P16263US1	3216
27045	7590	06/02/2008		
ERICSSON INC. 6300 LEGACY DRIVE M/S EVR 1-C-11 PLANO, TX 75024			EXAMINER CHENG, CHI TANG P	
			ART UNIT 4127	PAPER NUMBER
			MAIL DATE 06/02/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/518,208	Applicant(s) WIBERG ET AL.	
	Examiner PETER CHENG	Art Unit 4127	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>December 16, 2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 20 and 21 are objected to because of the following informalities: the language “according to any of the claims 17,” is inappropriate because Claims 20 and 21 appear to be single dependent claims. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 1-3, 9-11, 16-18, and 22** are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,748,901 to *Afek* et al.

4. **As to Claim 1**, *Afek* discloses a method for resource allocation in a packet transmission network including at least one link (e.g., col. 5, ll. 65—col. 6, ll. 7) comprising, the following steps: determining link resource status (e.g., col. 6, ll. 11); if link congestion is determined then (a) determining if it is possible to allocate more link capacity (e.g., col. 6, ll. 24-47 and ll. 64-67: “the rates of sessions that are below delta may be increased”); (b) allocating more link capacity when it is possible to allocate more link capacity (see, e.g., col. 6, ll. 24-47 and ll. 64-67: “the rates of sessions that are below delta may be increased”); (c) alleviating link congestion using Active Queue Management (e.g., col. 4, ll. 53-65) when it is not possible to allocate more link capacity (e.g., col. 4, ll. 53-65, wherein RED is disclosed as an example of AQM for alleviating

network and queue conditions likely to lead to congestion and it is thus evident that, as disclosed in *Afek*, one may choose to utilize AQM to alleviate congestion when allocating link capacity is no longer possible). **As to Claim 16**, please see the rejection above for Claim 1.

5. **As to Claim 2**, *Afek* further discloses the steps of defining in a buffer for said at least one link, a congestion threshold for packet queue size within said buffer (see, e.g., col. 6, ll. 24-47 and ll. 64-67: "the value of delta is easily computed in the output port of each link [partly] by counting the number of cells arriving at the queue of that port over an interval of time ..." and col. 6, ll. 57-63: wherein the value of a threshold MACR is computed based on weighted averages of the values of delta and MACR is used to restrict data rates, and thus, in summary, the threshold MACR is used to alleviate congestion and MACR is defined based on queue size; ALSO, see col. 4, ll. 59-61: "packets are dropped ... when the queue length at a link of the router exceeds a certain threshold"); and using said congestion threshold to detect link congestion when the packet queue size exceeds said congestion threshold (see, e.g., col. 6, ll. 64-67: in order to avoid underutilizing network resources, one could "restrict the sessions by a multiple of delta."; also, see col. 6, ll. 11-14: "setting a maximum allowed cell rate, MACR, equal to a weighted average of the delta and a prior value of MACR..."; ALSO, see col. 4, ll. 59-61: "packets are dropped ... when the queue length at a link of the router exceeds a certain threshold.")). **As to Claim 17**, please see the rejection above for Claim 2.

6. **As to Claim 3**, *Afek* further discloses adjusting the congestion threshold depending on link capacity. (col. 6, ll. 11-14, 24-47, 57-63: where delta is defined based on "the unused link capacity" and MACR, the maximum allowed cell rate, is defined based on a weighted average of values of delta and is used to "constrain the rates of session crossing a link"; thus, all of the above disclose that the threshold used, MACR is adjusted according to variations in the link capacity.) **As to Claim 18**, please see the rejection above for Claim 3.

7. **As to Claim 9**, *Afek* further discloses determining cell resource status (col. 6, ll. 11); if cell congestion is detected then (a) determining that it is necessary to switch down bit rate or rates in at least one link (e.g., col. 6, ll. 24-47 and ll. 64-67: "the rates of sessions that are above delta are reduced towards delta.") (b) alleviating link congestion using Active Queue Management (col. 4, ll. 53-65); (c) switching down said bit rate or rates (e.g., col. 6, ll. 24-47 and ll. 64-67: "the rates of sessions that are above delta are reduced towards delta."). **As to Claim 22**, please see the rejection above for Claim 9.

8. **As to Claim 10**, *Afek* further discloses alleviating link congestion for all links. (see, e.g., col. 5, ll. 64 - col. 6, ll. 14, where the disclosed method is applicable to all links; also see col. 4, ll. 53-65, wherein the RED strategy is applicable also to all links.)

9. **As to Claim 11**, *Afek* further discloses alleviating link congestion only for the links where link congestion is likely to occur. (see, e.g., col. 2, ll. 53-60, where "congested" or "very congested" links are restricted by a certain threshold, MACR and "not congested links are left alone.)

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. **Claims 4 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,748,901 to *Afek* et al., in view of U.S. Patent No. 6, 480,911 to *Lu*.

12. **As to Claim 4**, *Afek* discloses the method for resource allocation according to the parent claim 1.

13. *Afek* does not expressly disclose adjusting the congestion threshold depending on whether or not a packet is dropped/marked.

14. *Lu* discloses adjusting the congestion threshold depending on whether or not a packet is dropped/marked (col. 8, ll. 15-23).

15. *Lu* and *Afek* are analogous art because they are from the same field of endeavor with respect to network data transmissions and queuing methods related to network data transmissions.

16. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use whether a packet has been dropped as an indication of whether to adjust the congestion threshold, as disclosed by *Lu*, in conjunction with the method as disclosed and taught by *Afek*. The suggestion or motivation would have been to provide a method of handling congestion and maximizing utilization of network resources by

employing different queuing technologies. (*Lu*, col. 1, ll. 10-17, col. 2, ll. 62 - col. 3, ll. 5; *Afek*, col. 1, ll. 11-21).

17. **As to Claim 19**, please see rejection above for Claim 4.

18. **Claims 5, 6, 13, 20 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,748,901 to *Afek* et al., in view of the publication "Random Early Detection Gateways for Congestion Avoidance", by S. Floyd and V. Jacobson (IEEE/ACM Transactions on Networking, vol. 1, no. 4, pg. 397-413, August 1993).

19. **As to Claim 5**, *Afek* discloses the method of resource allocation according to the parent claim 2.

20. *Afek* does not expressly disclose adjusting the congestion threshold depending on buffer delay for a packet in the queue.

21. *Floyd* discloses adjusting the congestion threshold depending on buffer delay for a packet in the queue. (pg. 404, Section V.C., "the optimal value for [the threshold] depends, in part, on the maximum average delay that can be allowed by the gateway.")

22. *Afek* and *Floyd* are analogous art because they are from the same field of endeavor with respect to network congestion control technology employing queuing methods.

23. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to adjust the congestion threshold using the buffer delay, as disclosed by *Floyd*, in conjunction with the method as disclosed and taught by *Afek* because *Floyd* is incorporated by reference in *Afek*. (*Afek*, col. 4, ll. 53-65). The suggestion or motivation

would have been to provide a more desirable method of handling congestion. (see, e.g., *Afek*, col. 1, ll. 11-21, 53-55; *Floyd*, abstract).

24.

25. **As to Claim 20**, please see rejection for Claim 5 above.

26. **As to Claim 6**, *Afek* discloses the method of resource allocation according to the parent claim 2.

27. *Afek* does not expressly disclose defining in the buffer a maximum threshold and a minimum threshold for packet queue size within said buffer.

28. *Floyd* discloses defining in the buffer a maximum threshold and a minimum threshold for packet queue size within said buffer. (pg. 400, Section IV, first paragraph).

29. *Afek* and *Floyd* are analogous art because they are from the same field of endeavor with respect to network congestion control technology employing queuing methods.

30. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to adjust the congestion threshold using the buffer delay, as disclosed by *Floyd*, in conjunction with the method as disclosed and taught by *Afek* because *Floyd* is incorporated by reference in *Afek*. (*Afek*, col. 4, ll. 53-65). The suggestion or motivation would have been to provide a more desirable method of handling congestion. (see, e.g., *Afek*, col. 1, ll. 11-21, 53-55; *Floyd*, abstract).

31. **As to Claim 21**, please see rejection above for Claim 6.

32. **As to Claim 13**, *Afek* discloses the method of resource allocation according to the parent claim 1.

33. *Afek* does not expressly disclose alleviating link congestion by dropping or marking packets.

34. *Floyd* expressly discloses alleviating link congestion by dropping or marking packets. (pg. 400, Section III, fourth paragraph).

35. *Afek* and *Floyd* are analogous art because they are from the same field of endeavor with respect to network congestion control technology employing queuing methods.

36. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to adjust the congestion threshold using the buffer delay, as disclosed by *Floyd*, in conjunction with the method as disclosed and taught by *Afek* because *Floyd* is incorporated by reference in *Afek*. (*Afek*, col. 4, ll. 53-65). The suggestion or motivation would have been to provide a more desirable method of handling congestion. (see, e.g., *Afek*, col. 1, ll. 11-21, 53-55; *Floyd*, abstract).

37. **Claims 7 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,748,901 to *Afek* et al., in view of U.S. Patent Application Publication No. 2005/0053081 A1 to *Andersson* et al.

38. **As to Claim 7**, *Afek* discloses the method of resource allocation according to the parent claim 1.

39. *Afek* does not expressly disclose allocating link capacity by changing from a common channel to a dedicated channel.

40. *Andersson* discloses allocating link capacity by changing from a common channel to a dedicated channel (see, e.g., paragraph 15 and 71).

41. *Andersson* and *Afek* are analogous art because they are from the same field of endeavor with respect to providing more efficient and robust telecommunications networks.

42. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide more channel or link capacity by switching from a common to a dedicated channel, as disclosed by *Andersson*, in conjunction with the method as disclosed and taught by *Afek*. The suggestion or motivation would have been to provide a method of handling congestion and maximizing utilization of network resources. (*Andersson*, paragraphs 2 and 14; *Afek*, col. 1, ll. 6-21).

43. **As to Claim 8**, *Afek* discloses the method of resource allocation according to the parent claim 1.

44. *Afek* does not expressly disclose allocating link capacity by changing from a common channel to a dedicated channel.

45. *Andersson* discloses allocating link capacity by changing from a channel with a low bit rate to a channel with a higher bit rate. (see, e.g., paragraph 15 and 71).

46. *Andersson* and *Afek* are analogous art because they are from the same field of endeavor with respect to providing more efficient and robust telecommunications networks.

47. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide more channel or link capacity by switching from a common to a dedicated channel, as disclosed by *Andersson*, in conjunction with the method as disclosed and taught by *Afek*. The suggestion or motivation would have been to provide

a method of handling congestion and maximizing utilization of network resources.

(*Andersson*, paragraphs 2 and 14; *Afek*, col. 1, ll. 6-21).

48. **Claims 12 and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,748,901 to *Afek* et al., in view of U.S. Patent No. 7,193,966 B2 to *Gupta* et al.

49. **As to Claim 12**, *Afek* discloses the method according to the parent claim 1.

50. *Afek* does not expressly disclose if low usage of a link is detected then (a) determining if it is possible to decrease the link capacity without problems; (b) allocating less link capacity, when possible.

51. *Gupta* discloses if low usage of a link is detected (col. 1, ll. 48-51) then (a) determining if it is possible to decrease the link capacity without problems (col. 1, ll. 54-57); (b) allocating less link capacity, when possible (col. 1, ll. 54-57).

52. *Gupta* and *Afek* are analogous art since they are from the same field of endeavor with respect to providing more efficient and robust telecommunications networks.

53. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to allocate less link capacity to an underutilized or underused link, as disclosed by *Gupta*, in conjunction with the method as disclosed and taught by *Afek*.

The suggestion or motivation would have been to provide a method of handling congestion and maximizing utilization of network resources. (*Gupta*, col. 1, ll. 36-57; *Afek*, col. 1, ll. 6-21).

54. **As to Claim 23**, please see rejection above for Claim 12.

55. **Claims 14, 15, 24 and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,748,901 to *Afek* et al., in view of U.S. Patent No. 6,556,578 B1 to *Silberschatz* et al.

56. **As to Claim 14**, *Afek* discloses the resource allocation method according to the parent claim 2.

57. *Afek* does not expressly disclose using Active Queue Management separately for each buffer.

58. *Silberschatz* discloses using Active Queue Management separately for each buffer. (see, e.g., col. 1, ll. 47-49: "local states of the individual data flows."; and col. 4, ll. 60-63).

59. *Silberschatz* and *Afek* are analogous art since they are both from the same field of endeavor with respect to providing methods of congestion and flow control.

60. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use Active Queue Management separately for each buffer, as disclosed by *Silberschatz*, in conjunction with the method as disclosed and taught by *Afek*. The suggestion or motivation would have been to provide a method of handling congestion in a fair and optimized fashion. (*Silberschatz*, col. 2, ll. 37-47; *Afek*, col. 1, ll. 6-21; col. 4, ll. 53-65).

61. **As to Claim 24**, please see rejection above for Claim 14.

62. **As to Claim 15**, *Afek* discloses the resource allocation method according to the parent claim 2.

63. *Afek* does not expressly disclose using a general Active Queue Management for a number of buffers; and controlling the average traffic in the links associated with said buffers.

64. *Silberschatz* discloses using a general Active Queue Management for a number of buffers (see, e.g., col. 1, ll. 47-49: "local states of the individual data flows."; and col. 4, ll. 60-63: "local queue size threshold and a buffer occupancy for ... possibly various combinations of two or more queues") and controlling the average traffic in the links associated with said buffers (see, e.g., col. 5, ll. 1-8)

65. *Silberschatz* and *Afek* are analogous art since they are both from the same field of endeavor with respect to providing methods of congestion and flow control.

66. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use Active Queue Management for a number of buffers and controlling the associated traffic, as disclosed by *Silberschatz*, in conjunction with the method as disclosed and taught by *Afek*. The suggestion or motivation would have been to provide a method of handling congestion in a fair and optimized fashion. (*Silberschatz*, col. 2, ll. 37-47; *Afek*, col. 1, ll. 6-21; col. 4, ll. 53-65).

67. **As to Claim 25**, please see rejection above for Claim 15.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PETER CHENG whose telephone number is (571)272-9021. The examiner can normally be reached on M-Th, 8:00AM - 5:00PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Derrick Ferris can be reached on (571)272-3123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/P. C./
Examiner, Art Unit 4127

/Derrick W Ferris/
Supervisory Patent Examiner, Art Unit 4127